ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

Illinois Department of Transportation

The INHS IDOT Programs

Annual Report 2012

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2012 Annual Report

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Mengelkoch, Jean, MS	Mammalogist
Johnson, Kevin, PhD	Ornithologist
Schelsky, Wendy, PhD	Ornithologist
Taylor, Steven J., PhD	Biological Surveys Program, Coordinator — Aquatic systems; Invertebrate ecologist
Cummings, Kevin, MA	Malacologist
Kuhns, Andrew R., MS	Herpetologist
Taylor, Chris, PhD	Icthyologist, Astacologist
Tiemann, Jeremy, MS	Aquatic zoology specialist
Wetzel, Mark J., MS	Macroinvertbrates, Water Quality specialist
Taft, John B., PhD	Biological Surveys Program, Coordinator — Botany
Bertz, Christine, PhD	Botanist
Handel, William, MS	Botanist
Hill, Steven R., PhD	Botanist
Murphy, Michael J. C., MS	Botanist
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Jarvis, Janet, BS	GIS specialist
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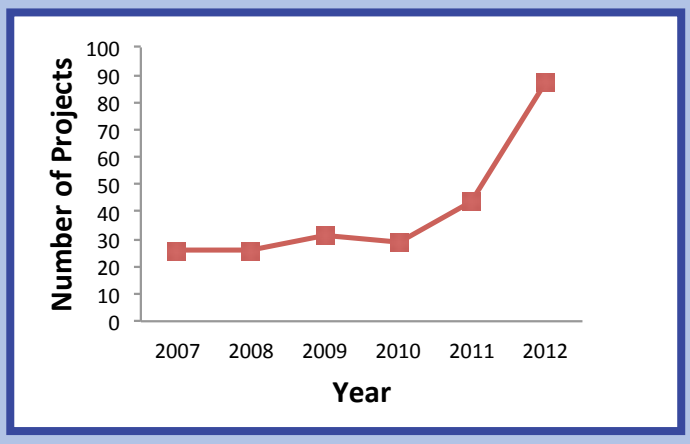
Phillippe, Rick, PhD	Collections manager — herbarium
Wylie, Daniel, MS	Collections manager — non-insect zoology

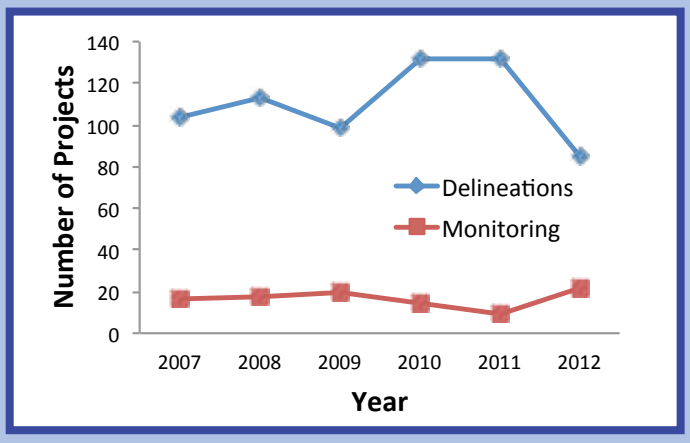
The INHS IDOT Programs

This was a year of change for both the Wetlands Vegetation and Soils (Wetland Science Program) and Biological Surveys and Assessment (Biological Surveys Program) teams. We said goodbye to several long-serving, outstanding staff, and welcomed others. In the Wetland Science Program, botanists Mary Ann Feist (PhD) and Jason Zylka (MS) completed advanced degrees at the University of Illinois and moved on to new positions. Soil scientist Ian Draheim returned to his home state of Wisconsin after commencing married life. Long-time Program Leader Allen Plocher moved on to another full-time position in INHS. Wetland Science Research Program Leader Jeff Matthews accepted a position as Assistant Professor in the Department of Natural Resources and Environmental Sciences at the University of Illinois in August 2012. Dr. Matthews will retain his connection with the Wetland Science Program by advising graduate students, mentoring staff on research projects, and incorporating the IDOT wetlands database in his ongoing, cutting-edge research. Brian Wilm and Scott Wiesbrook admirably assumed new leadership roles in the wetlands team, and we were lucky to hire 5 excellent, experienced new staff: botanists Julie Nieset, Meg Engelhardt, Susan McIntyre, and Ben Beas, and soil scientist Jenwei Tsai.

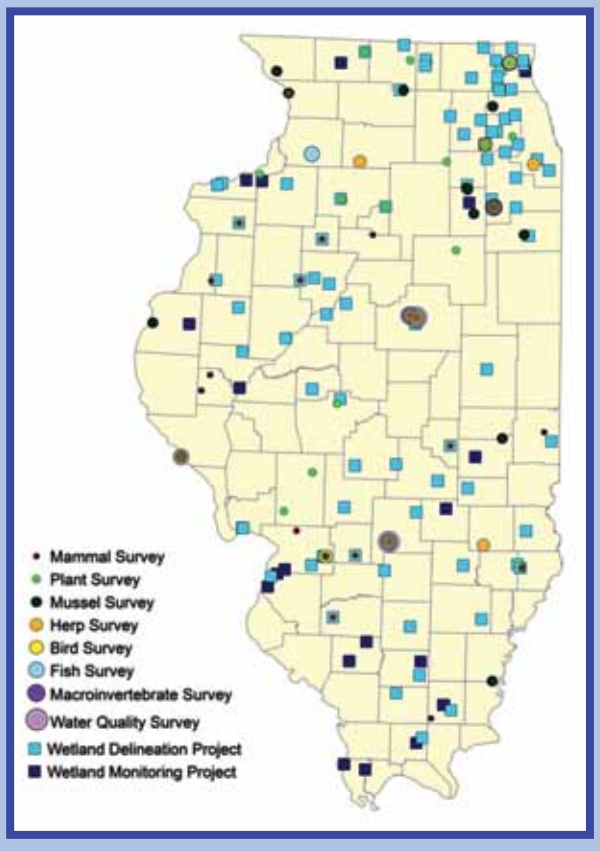
To assist with the increased botanical workload in the Biological Surveys Program, we added botanist Christine Bertz to our staff. Ornithologist Kevin Johnson left the INHS IDOT team in October to become a full-time Research Program Leader at INHS. Ornithologist Wendy Schelsky will shift from part-time to full-time on the INHS IDOT team in 2013 in response.



Number of projects conducted by the Biological Surveys Program over the past 6 years. Note the increase in 2012.



Numbers of wetland delineation and monitoring projects conducted by the Wetlands Program over the past 6 years.



Locations of INHS IDOT projects conducted in 2012

In 2012, the INHS IDOT teams conducted 171 field projects in 72 of Illinois' 102 counties. The Wetland Science Program conducted 85 wetland delineation projects and 22 monitoring projects. The number of delineation projects was slightly lower than in recent years, but several of these were large, multi-year projects and simply considering their number can be misleading. For example, in 2012 the wetlands team delineated or monitored 700 individual wetlands, totaling over 500 acres and including 1,088 assessment points. While the numbers of fish and crayfish and water quality projects were about average, the numbers of bird, herp (reptile and amphibian), and macroinvertebrate projects were up slightly, and the numbers of mammal, botany, and mussel projects were well above the norm. The 87 projects conducted by the Biological Surveys Program in 2012 was more than double the total from the previous several years. Project reports submitted in 2012 are listed at the end of this report.

Thus, demand for the expertise of our highly skilled staff continues to grow. With renewed attention on the transportation infrastructure of Illinois, including plans for new highways such as the Illiana Project in northeastern Illinois, proposals for high-speed rail, and repairs needed for many bridges, overpasses, and roadways, the INHS IDOT programs continue to provide essential, quality services to the state. Our scientists also conduct critical research on the biological resources of Illinois, including factors affecting wetland restoration, the effects of acoustic landscapes on avian communities, the impact of white-nose syndrome on Illinois bats, and the first study to monitor the success of translocations of endangered mussels, to name just a few. This report can highlight only a few of our many activities.

Wetland Science Program Focuses on Large Projects in 2012

Scientists of the Wetland Science Program focused much of 2012 on several large-scale IDOT wetland survey projects; foremost among this work was the Illiana Project. The research corridor investigated for this project stretches from the Indiana state line across the width of Will County, totaling about 37 miles and covering approximately 14,000 acres. Most of the field work was completed in 2012, but the remainder will be finished in spring 2013 with a report to follow. The 5th year of wetland surveys was completed on the US 51 project in Shelby, Fayette, Marion, Washington, Christian, and Clinton counties; the 2012 addendum covered an additional 1,200 acres. A 27-mile stretch of US 50 in the southern Illinois counties of Lawrence and Richland was surveyed , as was an 11-mile section (approximately 800 acres) of IL Routes 83 and 173 in Lake County. In the central part of the state, a proposed bypass covering over 10,000 acres around the east side of Bloomington was investigated. Across northern Illinois, over 150 miles of railroad line stretching from Rock Island on the Mississippi River in the far western part of the state to Union Station in downtown Chicago was surveyed for potential wetland impact as part of a proposed upgrade to high-speed rail transit.

Brad Zercher in a wetland affected by severe drought

Jenwei Tsai collecting a soil core sample

Several on-going wetland mitigation monitoring projects for the Illinois Department of Transportation are also of note. 2012 was the 9th year of monitoring on the large Morris mitigation bank located in Grundy County near the Illinois River. Now managed by the Illinois Department of Natural Resources, over 100 acres of restored forest continue to be monitored on a yearly basis. Monitoring and restoration continue at the extensive La Grange wetland bank located at the confluence of the Illinois and La Moine rivers in Brown County. Over 800 acres (including several parcels newly planted with young trees) were added to the ongoing monitoring at this site in 2012, bringing the total of potential wetland restoration acreage to over 1,600 acres. Monitoring was officially initiated at the 151-acre North Chicago mitigation bank in Lake County. Although technically a new wetland monitoring project, the Wetland Science Program has been involved in various forms of data collection at this site for several years. Phase 1 of the Sugar Camp Creek wetland mitigation bank in Franklin County in southern Illinois opened for monitoring in 2012. Largely involving restoration of forested wetlands, 44 acres were monitored this past year, with plans for an additional 61 acres to be added in 2013. Two other wetland mitigation monitoring projects were also initiated in 2012 — Max Creek in Johnson County and East Cape Girardeau in Alexander County.

Dave Ketzner delineating a wetland with GPS

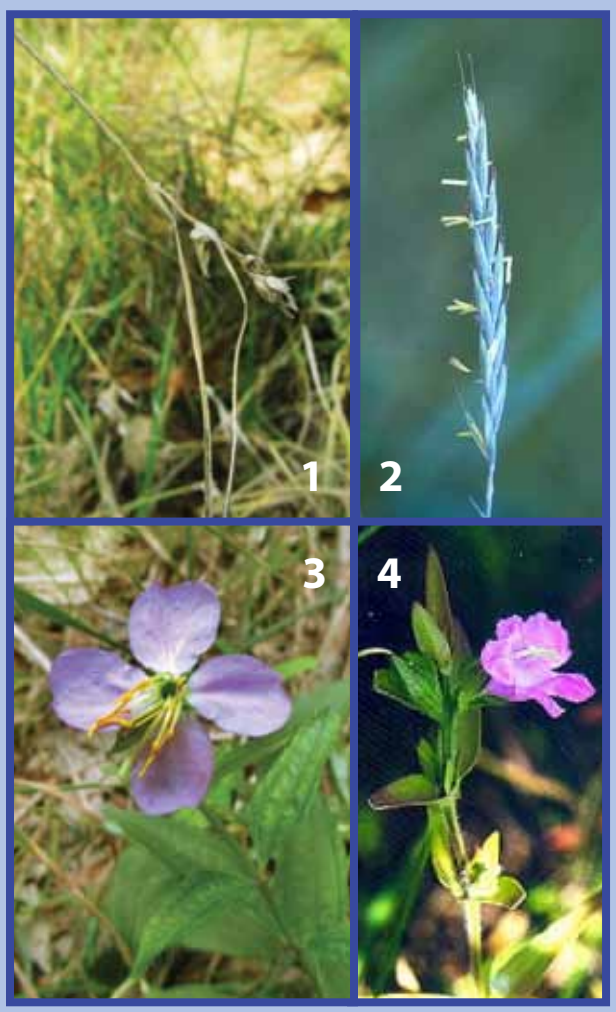
Dennis Keene and Ben Beas conducting a plant survey at a monitoring site

New Records of Illinois Wetland T&E Species for 2012

Boltonia decurrens (false decurrent aster) is a light- and moisture-limited perennial species endemic to the Illinois River Valley. It reproduces sexually via seed and vegetatively through the production of new basal shoots. *B. decurrens* relies on disturbance, historically as flooding, to create new habitat for colonization and to remove competing species. The species is listed as both federally and state endangered. Information available prior to this report suggested there may be as few as 43 known populations of *B. decurrens*.

During a wetland delineation survey for proposed work on IL 89 (FAP 698) over the Illinois River at Spring Valley in Bureau and Putnam counties, Valerie Sivicek and Julie Nieset (Wetlands Science Program) found several *B. decurrens* within the project corridor. Subsequently, Christine Bertz (Biological Surveys Program) conducted an in-depth study of the entire project corridor for the presence of *B. decurrens.* Four distinct colonies containing over 7,000 individuals of *B. decurrens* were located within the project corridor, occupying over 4 acres. Another 20,000+ individuals and a 5th colony were located outside the project corridor in the surrounding area. Maps of the extent of all 5 colonies were submitted to the Illinois Natural Heritage Database.

False decurrent aster



1) Arkansas sedge 2) Slender wheatgrass 3) Dull meadow beauty 4) Ear-leaved false foxglove

Arkansas sedge (*Carex arkansana*; State Endangered) was observed during IDOT field surveys in 2012 in Lawrence and Saline counties. This perennial sedge grows in tufts or small clumps and is found in moist prairies, forest openings, and sometimes disturbed grassy areas and roadside ditches. It was first collected in Illinois only recently — in 1992 in Saline County. Illinois is at the northeastern edge of the range of this species.

Slender wheatgrass (*Elymus trachycaulus*; State Threatened), found only in the northern part of Illinois, was observed in Lake County during 2012 field surveys. This perennial, cool-season grass grows in tufts in mesic prairies and wet dolomite outcrops. This species was among the first native grasses widely used for reclamation in western Canada and the U.S. and has been successfully used for the reclamation of mine spoils, oil sands, and other disturbed sites.

Dull meadow beauty (*Rhexia mariana*; State Endangered) is a perennial herb with hairy, lance-shaped, distinctly veined leaves and a cluster of yellow-orange stamens contrasting with almost white to rose-colored flowers. This species prefers wet meadows, seep springs, and sandy fields with acidic soils. Illinois and southern Missouri are this species' northwestern range limit. *R. mariana* was observed in Williamson County during 2012 field surveys.

Ear-leaved false foxglove (*Tomanthera auriculata*; State Threatened) is scattered throughout Illinois, except in the extreme south. This annual herb occurs in disturbed prairies, savannas, abandoned fields, and woodland borders. It is semi-parasitic on the roots of other plants, particularly *Aster* spp., but also can photosynthesize to fully meet its nutritional needs. *T. auriculata* was observed in Will County during 2012 field surveys.

Restoration Progress and Flood Disturbance at IDOT Wetland Mitigation Sites

IDOT has created and restored wetlands at mitigation sites throughout Illinois to compensate for impacts to natural wetlands by road construction. Most IDOT wetland mitigation sites are located in floodplain areas. Although floodplain wetlands are supported by regular flooding, floods can also produce excessive sediment, cause ice damage, and result in prolonged inundation, leading to mortality of wetland plants and planted trees, and poor plant-community quality (e.g., low species richness). Progress toward restoring wetlands is measured through the use of prescribed performance standards issued by state and federal regulatory agencies. Dr. Jeff Matthews and Geoff Pociask analyzed data collected by the Illinois Natural History Survey and the Illinois State Geological Survey during past and current site monitoring to examine the ecological mechanisms that lead to variation in performance levels among a large number of floodplain compensatory mitigation wetlands. The goals of the study were to evaluate the influence of flooding on plant community quality and successional trajectories at wetland mitigation sites.

Mean annual flood exposure had significant, inverse relationships with 3 of the 10 plant community metrics they examined: species richness, Floristic Quality Index, and proportion of perennial species. During years with acute flood disturbances, all 6 plant species groups examined (annuals, perennials, natives, non-natives, hydrophytes, and non-hydrophytes) suffered high rates of local extinction. In the year following major flood events, however, colonization rates increased, particularly for non-hydrophytic, annual, and non-native species. This study demonstrates that higher average magnitudes of flooding at IDOT mitigation wetland sites will lead to decreased species diversity, floristic quality, and proportion of perennials in floodplain settings. Higher magnitude floods also tend to disrupt succession by eliminating the species groups that are associated with higher quality plant communities, and in the year following flood disturbance, allow more undesirable species to colonize. These tendencies highlight the importance of considering flood-disturbance regimes when evaluating the quality of plant communities in floodplain wetlands.

A late season flood that coated plants and trees with sediment

Inundation and ice formation around newly planted trees

An early growing season flood that did not inundate most trees but killed plants in the herb layer

Ice damage to trees after year 3 of restoration

Jordan Jessop evaluating soil in a mitigation wetland

Ecosystem Functions of Mitigation Wetlands

Wetland soil scientist George Geatz, MS student Jordan Jessop, and Dr. Jeff Matthews are exploring tradeoffs among ecosystem functions provided by IDOT compensatory mitigation wetlands. These wetlands are constructed when natural wetlands are impacted by development, with the assumption that a wetland of equivalent quality can be created. However, recent evidence suggests that this is not always the case. By collecting data on vegetation, soil, and biodiversity, these researchers seek to quantify various indicators of wetland structure and function in 30 restored and 15 natural reference wetlands ranging from high- to low-quality across the state of Illinois. This research will evaluate how restored wetlands compare functionally to natural reference wetlands, and to determine what tradeoffs exist among the ecosystem functions of different types of mitigation wetlands. Results can help guide future wetland mitigation policy.

New Research on the Wetland Indicator Status of Common Buckthorn

Several plant species had their wetland indicator status changed in the most recent update of the National List of Plants that Occur in Wetlands. Some species, such as *Campsis radicans* (trumpet creeper), were changed to a drier status. Others, such as *Poa pratensis* (Kentucky bluegrass) and *Rhamnus cathartica* (common buckthorn), were changed to a wetter indicator status. Changes in the indicator status of the latter 2 species have resulted in more areas meeting the 3 criteria required for designation as wetlands.

Buckthorn specimens in one of the flooding studies

Research conducted in the Wetland Science Program by Jesse Kurylo partially supports the move of *R. cathartica* to a wetter indicator status. A metadata-study of IDOT wetland determination projects conducted over 16 years found common buckthorn occurring in 37% of wetland sites and as a dominant in 7% of those sites. Greenhouse studies showed that 17–20-month old and 4–8-month old *R. cathartica* seedlings could be flooded to a depth of 2 inches above the soil surface for 3 to 4 weeks before measurable growth stopped. By the end of 11 weeks, most (86%) of flooded plants appeared dead, but only 43% of plants subjected to a cycle of flooded and nonflooded conditions appeared dead. A follow-up study found that even after 5 weeks of flooding to a depth of 2 inches, 7 out of 12 *R. cathartica* individuals showed small signs of recovery after just 1 week of nonflooded conditions through stem and/or branch elongation and new branch development.

Jesse Kurylo and buckthorn in a wetland

Wetland Soil Science Research

Wetland soil scientist George Geatz completed his MS degree in Wetland Science from the University of Maryland in May 2012. His research focused on wetland biogeochemistry, specifically the response of Chesapeake Bay brackish marshes to prescribed winter burning. Although burned areas of marsh appear healthier than unburned areas, the mechanisms by which this occurred were unknown. George used porewater nutrient analyses to determine that decreased ammonium and phosphate levels following burning contributed to lower rates of soil organic matter decomposition and greater soil strength in burned areas. In conjunction with increased plant productivity, these are likely the reasons that burned marsh areas are lost to rising sea levels at slower rates than unburned areas. By analyzing the nutrient content of the plant ash and modeling fire temperatures during prescribed fires in coastal marshes, George determined that there was no direct fertilization effect caused by burning, as is commonly thought, but rather increased plant productivity is attributed to decreased light competition.

George Geatz taking a soil sample

New Searchable Wetland Database

The INHS has conducted wetland surveys for IDOT since 1987. Data associated with wetland delineations and mitigation monitoring are now available in the new Wetland Science Database. This database allows multiple users to input data from IDOT projects simultaneously and has increased quality control through data validation and standardization. It has also streamlined report writing by providing wetland delineation forms, plant species lists, and summary information reports at the click of a button once the field-collected data are entered. Most data, current and historic, have now been entered into the new database which houses information for over 2,000 projects, 12,500 sites, and 13,000 assessment points. The database not only includes information on each project, but also information on the sites and points sampled including hydrology, soil data, and species lists. While basic searches can be performed by all Wetland Science Program staff, more complicated inquiries for data can be directed to the database manager, Laura Sass (lcanny@illinois.edu).

The database is flexible to accommodate changes and differences in reporting requirements from both IDOT and the U.S. Army Corps of Engineers, thus database design and maintenance is ongoing. Current goals include organizing a geodatabase of Wetland Science Program GIS data that can be linked to the project database, and organizing the long-term storage of reports, correspondence, and other associated files in a standardized digital filing cabinet.

During 2012, we successfully integrated the mitigation monitoring data into the database and created a separate Microsoft Access interface for data entry and searching the data. The database now houses mitigation data for 73 monitoring projects across the state.

Wetland Science Program homepage: http://wwx.inhs.illinois.edu/research/wetlands

New Geodatabase Being Developed for Biological Surveys Program

A geodatabase is a database containing information related to specific locations. These locations can be either spatial, temporal, or both. Janet Jarvis, GIS specialist for the Biological Surveys Program, is creating a geodatabase that will contain information on every IDOT survey the program has conducted from 1995 to present. This information will include which disciplines were assigned, when fieldwork took place, for what species surveys were conducted, if survey results were positive or negative, and if any threatened or endangered species were found. By the end of 2013, we anticipate completing data entry for field seasons 2010–2012. This will be a long-term project starting with data from the most recent years and working back to the goal of 1995.

Wetland Science Program Website Launched, Biological Surveys Program Website Underway

The Wetland Science Program website has been upgraded to the Concrete5 interface, allowing information to be quickly and easily updated. The website includes information on the program, staff pages highlighting each individual's expertise and research experiences, research and outreach project highlights, as well as an extensive photo gallery.

The Biological Surveys and Assessment Program began work on a similar website in 2012. The new site is scheduled to launch in 2013 and will include information about the program, research projects and public outreach in which the program staff are involved, as well as a bibliography of scientific publications and a photo gallery.

Training New Soil Scientists

Soil scientists George Geatz, Jenwei Tsai, and Scott Wiesbrook of the Wetland Science Program assisted Dr. Robert Darmody of the Department of Natural Resources and Environmental Sciences with the University of Illinois soil judging field class. Scott has been involved with soil judging since 1989, first as a competitor and then as a coach for both the University of Illinois and Blackhawk College – East Campus soil judging teams. Jenwei has been with the University of Illinois team since 2006, first as a competitor then as an assistant coach. George was a member of the University of Maryland team in 2008 and as a graduate assistant in 2010. Soil judging is a practical, hands-on, and field-based learning opportunity for undergraduate students to develop interest and a deeper appreciation of soils and pedologic processes. This year, the University of Illinois soil judging team placed 4th overall out of 8 teams in the regional competition and qualified for the national competition to be held in the spring of 2013 in Platteville, WI.

U of I soil judging field class

Teaching Children About Wetlands

Wetland botanist Julie Nieset coordinated construction of a small wetland at Dater Montessori Elementary School in Cincinnati, OH, in September 2012. The new wetland is located a short walk from the school between the school garden and orchard. This wetland will serve as an educational tool for students at the school and residents in the community. Students from preschool through 6th grade watched the excavation process, learned about surveying tools and techniques, assisted with raking the soil, laying the liner and geotextile, spread wheat seed and straw for erosion control, helped plant and water the plants, and learned about soil and wetland plant characteristics. Five teaching stations at the site instructed students about wetland fauna, water infiltration, and why wetlands are important. Learn more about the project on the Wetland Science Program website. What a great idea for Illinois schools!

Students spreading straw with educational stations in background

Students planting wetland plants

Students learning about surveying techniques

US HWY 50 SURVEYS

US Highway 50 Surveys

The US 50 project stretches approximately 30 miles from west of Olney to east of Lawrenceville, encompassing, 2,624 acres in Lawrence and Richland counties. The anticipated construction includes widening along the existing alignment from 2 to 4 lanes. The IDOT Wetlands and Biological Surveys groups canvased the area for wetlands, undiscovered natural areas, and threatened and endangered flora and fauna.

Person day:

1 person in the field for 1 day; excludes all work done in the office or lab

Botanical Surveys

Who: Steve Hill
Person Days: 10
What we found: 478 plant species were found within the project corridor, including 8 species with a Coefficient of Conservatism (C value) >7: *Acalypha deamii* (C = 8), *Ammannia auriculata* (C = 8), *Armoracia aquatica* (C = 10), *Asclepias perennis* (C = 10), *Carex swanii* (C = 8), *Cuscuta compacta* (C = 10), *Lycopus rubellus* (C = 8), *Sedum ternatum* (C = 9) and the State Endangered *Carex arkansana* (C = 8).
None of the 6 Illinois T&E species previously reported from the vicinity of this corridor were found.

Mussels

Who: Kevin Cummings, Jeremy Tiemann, Chris Taylor
Person Days: 3
What we found: Evidence of 7 of the 13 historically present species was detected but only 2 species were found alive: 8 pondhorn (*Uniomerus tetralasmus)* and 17 lilliput (*Toxolasma parvus*), both common species.

Herps

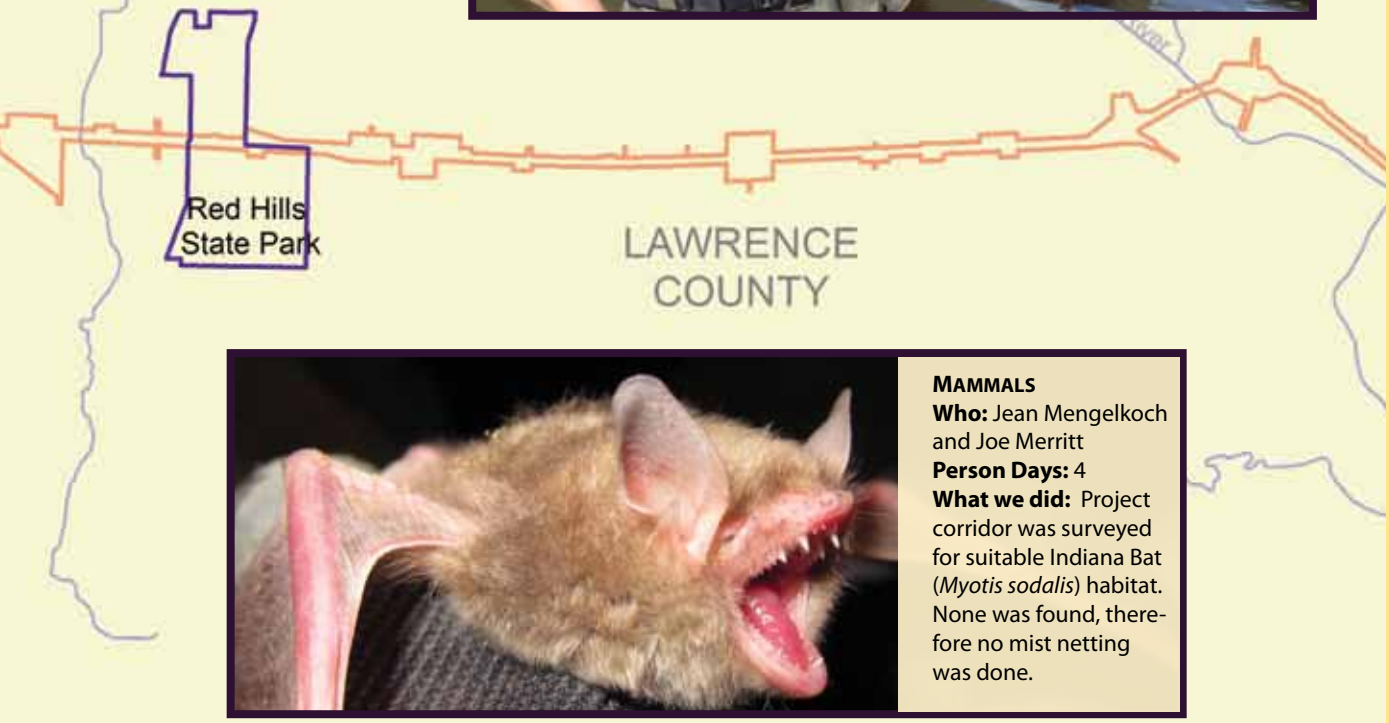
Who: Andy Kuhns
Person Days: 5
What we found: Project corridor was surveyed for the 4-toed salamander (*Hemidactylum scutatum)* in and around Red Hills State Park. None were located during the survey, but had been seen just previous to the survey work.

Water Quality

Who: Mark Wetzel, Kristi Moss (Steve Taylor helped in the lab)
Person Days: 8
What we found: Sampling was severely affected by the drought; sampling started with 6 streams in May, was reduced to 5 in June, and only 3 in August.

US HWY 50 SURVEYS

Fish
Who: Kevin Cummings, Jeremy Tiemann, Chris Taylor
Person Days: 3
What we found: 38 species of fish were found over 3 sampling sites. The State Endangered eastern sand darter was found in the Embarras River at the existing US 50 bridge.



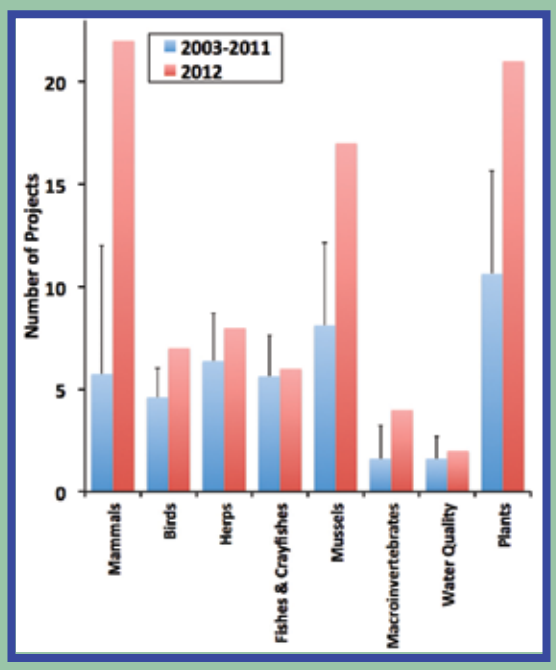
Mammals
Who: Jean Mengelkoch and Joe Merritt
Person Days: 4
What we did: Project corridor was surveyed for suitable Indiana Bat (*Myotis sodalis*) habitat. None was found, therefore no mist netting was done.

With the exception of low dissolved oxygen values recorded at some sites (small tributary streams that were severely affected by the drought), all other values for water quality parameters, both field and lab measurements, were comparable to values measured at many other streams in Illinois.

Wetlands
Who: Valerie Sivicek, Dave Ketzner, Dennis Keene, Jesse Kurylo, Susan McIntyre, Dennis Skultety
Person Days: 71
What we found: 77 wetlands out of 90 determination sites
–11 sites with an FQI >20
–1 site with and FQI >30
– located the State Endangered Arkansas sedge (*Carex arkansana)*

Aquatic Zoology Group

In 2012, the IDOT Aquatic Zoology Group was assigned 8 herpetological projects (2nd highest number in the last 10 years), 6 fish and crayfish projects, 17 mussel projects (highest number ever), 4 macroinvertebrate projects, and 2 water quality projects. Among the larger projects were a 35-mile corridor (Illiana Expressway) in Will County, and a 26-mile corridor (U.S. Hwy 50) in Lawrence and Richland counties. Habitat assessments were completed at 34 stream sites, surveys for aquatic macroinvertebrates were completed at 18 stream sites, and water quality monitoring was conducted at 10 stream sites in these 2 project areas plus Timber Creek (McLean County).



Biological Surveys Program projects for 2012

Fish and mollusk projects ranged from Mill Creek in Lake County to the Mississippi River in Carroll and Pike counties to the Little Wabash in Gallatin County. While many locations were channelized ditches passing through agricultural fields, we also sampled some high-quality sites such as Rock Creek in Kankakee River State Park, where a high-quality riffle contained a diverse darter and benthic fish community — one of the nicer streams in central Illinois. New records of the State Threatened eastern sand darter and the snuffbox, a Federally Endangered mussel species, were recorded. The INHS IDOT aquatic staff also continued their participation in reintroductions of 2 Federally Endangered mussels (northern riffleshell and clubshell) and the State Endangered red-spotted sunfish in Illinois.

INHS IDOT herpetologists conducted surveys for projects as diverse as creation of bike/pedestrian paths in Monroe County to improvements to rail lines for high speed travel in McLean County to replacement of culverts along a highway in Lee County. Surveys ranged from trapping Blanding's turtles in cattail marshes to conducting visual encounter surveys for Great Plains ratsnakes and coachwhips to dip-netting and trapping for mudpuppies. Some interesting records included the State Threatened 4-toed salamander in Lawrence County and State Threatened mudpuppy in the Macinaw River, McLean County.

The INHS IDOT Aquatic Group continues to serve as leading experts on aquatic zoology in Illinois. Kevin Cummings and Jeremy Tiemann presented papers at the Illinois Chapter of the American Fisheries Society meeting. Kevin also taught workshops on mussel identification and worked on several research grants. Jeremy Tiemann and Chris Taylor published a paper on the conservation status of the longnose dace. Jeremy was awarded 4 new grants in 2012 to study snails and mussels in Illinois. Andy Kuhns worked on several research grants focused on Illinois herps, and published a paper on survey methods in the *Journal for Nature Conservation*. Mark Wetzel co-authored an important paper on the terrestrial worms of North America, and continued his grant-funded research. Steve Taylor and Chris Taylor also continue to publish and secure grant funds for additional research.

Christine Bertz conducting a plant survey

Ethan Kessler checking turtle traps

Mark Wetzel collecting aquatic invertebrate samples

New Focus on Bats

A recent and dramatic decline in bat populations has been unfolding in northeastern North America. A malady known as white-nose syndrome (WNS) has killed millions of bats of at least 8 species (including the Federally Endangered Indiana bat, a focus of IDOT surveys) in the northeastern USA and Canada since 2006. The disease is caused by the invasive fungus *Geomyces destructans*, which resides in cold places like the caves in which some bat species hibernate. Mortality rates exceeding 90 percent have been reported in some hibernation caves, and at present, there is no known remedy to halt this disease. Dead or dying bats are typically dehydrated and emaciated, left with little or none of the fat stored to survive the long months of hibernation. Scientists with the INHS, the University of Illinois, the IDNR, U.S. Forest Service-Shawnee National Forest, and the UIUC Veterinary Diagnostic Laboratory, are examining the hibernating bats as well as microbial and fungal communities in Illinois caves in hopes of better understanding WNS. In winter 2013, Illinois became the 20th state in which WNS was confirmed.

Ed Heske and Joe Merritt swabbing a bat to survey for the WNS fungus

Due in part to this increased focus on bats, the number of INHS IDOT projects targeted at Indiana bats tripled in 2012. Each project included 1–10 sites that were surveyed for bats. A typical bat survey entails running 2 sets of mist nets from about dusk to 2 AM for 2 consecutive nights. Nets are stacked on poles running about 20 ft high, and must be constantly monitored so that captured bats can be removed, examined, and released quickly to avoid stress to potential endangered species. Data from these surveys not only inform IDOT about the species present at project sites, but can help monitor trends in abundance over time as WNS impacts Illinois bat populations.

Hoary bat

Illinois is home to 13 species of bats ranging in size from the largest bat in North America, the hoary bat (*Lasiurus cinereus*, 20–35 g), to the diminutive tri-colored bat (*Perimyotis subflavus*, 4–5 g). One site surveyed by INHS IDOT mammalogists in 2012, a proposed runway modification to the Edgar County Airport, yielded an unusually diverse bat assemblage. In a single night, the survey team captured big brown bats (*Eptesicus fuscus*), northern long-eared bats (*Myotis septentrionalis*), evening bats (*Nycticeius humeralis*), red bats (*Lasiurus borealis*), and a beautiful hoary bat, the crown jewel for bat biologists in Illinois.

Snoopers and Bridges

During a spring bridge inspection an IDOT employee noted "a bunch of brown bats" nestled under the Savanna/Sabula Bridge over the Mississippi River. Mammalogist Joe Merritt and IDOT bridge crew technicians Matt Wild and Mike Hubbell used a vehicle-mounted "snooper" to investigate and tally the bridge visitors. The survey covered the length of the bridge from Iowa to Illinois, and revealed bats nestled within 8 of the 5-inch spaces formed by segments of PJF joints. The total number of roosting bats observed was about 100, but there may have been more hidden in the recesses of the joints. All were identified as little brown bats (*Myotis lucifugus*), a species that hibernates in Illinois caves and in summer forages for insects around the nearby Mississippi River and forests. There are 37 bridges that traverse the Mississippi River between Iowa and Missouri—ideal sites for roosting bats!

Snooper

Little brown bats under the bridge

Ornithology Field Surveys

Yellow-headed blackbird

The Ornithology Group completed 8 IDOT assessments in 2012. Two projects in northeastern Illinois, the IL 83 & IL 137 projects in Lake County, focused on assessing potential impacts on the many marshes in or near the project areas known to support wetland bird species. Every one of the sites visited during our surveys had lost at least one marsh-nesting species. Most populations were small compared to recent descriptions. In some sites, the marsh habitat had been compromised to such an extent that wetland birds were no longer supported. Loss of marsh-nesting species is a reoccurring pattern in our IDOT surveys in northeastern Illinois. Since joining the IDOT Biological Surveys group in 1994, Dr. David Enstrom has often found areas that once supported populations of marsh-nesting species have lost some or all of these species.

Northeastern Illinois, particularly McHenry, Lake, Kane, DuPage and Cook counties, was historically rich in wetland and lake habitats and had vibrant populations of wetland bird species. The IDNR's *Northeastern Illinois Wetland Bird Survey* has monitored these species since 1963. A recent analysis of these data by INHS and UIUC ornithologist Dr. Mike Ward and colleagues revealed that Black-crowned Night-Herons (State Endangered), Common Moorhens (State Endangered), Yellow-headed Blackbirds (State Endangered), Least Bitterns (State Threatened), King Rails (State Endangered), Pied-billed Grebes (Illinois special concern), Sora (Illinois special concern), and Virginia Rails (Illinois special concern) declined significantly over a 26-year period. They concluded that urbanization (e.g., wetland alteration or destruction through development or incidental changes in hydrology) was the primary cause of the declines.

Monitoring Created Seasonal Wetlands

The Illinois Wildlife Action Plan (IWAP) is designed as a management tool to reduce and reverse the species extinction crisis by managing for species before they become endangered. One of the priority campaigns listed in the IWAP is the creation of temporary seasonal wetlands in Illinois, partly to aid in the preservation of amphibian species in greatest need of conservation. As part of this campaign, over 250 temporary seasonal wetlands were created on state managed properties in east-central Illinois. Unfortunately, current state financial constraints have prevented follow-up surveys of these ponds to assess their efficacy.

In 2011, INHS IDOT herpetologist Andrew Kuhns, along with Lindenwood University faculty members John Crawford and Paige Mettler-Cherry, received a Region 5 Wetlands Protection Development Grant from the U.S. Environmental Protection Agency to develop a sampling methodology that evaluates overall health and function of created seasonal wetlands in the state of Illinois. They have been sampling amphibians, water quality, and vegetation from 60 created and 20 reference wetlands across 10 state-managed properties to develop a rapid assessment Index of Biological Integrity (IBI). Preliminary results indicate that although amphibians, including endangered, threatened, and special concern species, quickly colonize these created wetlands, the IBI scores of the reference wetlands are significantly higher than those of created wetlands regardless of age of the created wetlands. Final analyses will aid in determining which characteristics of created wetlands are successful in replicating the existing wetlands and provide guidelines for subsequent pond creation projects across Illinois.

Checking drift fences at a seasonal wetland

Reintroduction of the Northern Riffleshell and Clubshell in Illinois

The Illinois Department of Natural Resources (IDNR) and INHS partnered with the U.S. Fish and Wildlife Service (USFWS) and state agencies in Ohio and Pennsylvania to reintroduce the Federally Endangered northern riffleshell (*Epioblasma rangiana*) and clubshell (*Pleurobema clava*)into Illinois. Both species were historically present throughout the Ohio River drainage, including the Vermilion River of the Wabash drainage. However, both species experienced significant declines and were considered extirpated from Illinois. This range-wide decline is attributed to a combination of issues including impoundments, siltation, pollution, stream dredging, and exotic species.

A bridge project on the Alleghany River in Pennsylvania provided an opportunity for the translocation of northern riffleshells and clubshells to Illinois. Beginning in 2006, biologists from IDNR and INHS began preparing for this move. One of the first steps in the process was identifying areas with suitable fish hosts. In order to reproduce, freshwater mussels need an appropriate fish host to complete their life cycle. Northern riffleshell larvae (glochidia) need to attach to the fins and gills of various darter species, whereas clubshell glochidia are believed to use various minnows or darters. Biologists sampled more than 40 sites that historically had either the mussels or the fish hosts. The second step in the process was identifying areas with diverse and abundant freshwater mussel assemblages. Data from the INHS Mollusk Collection were used to identify areas that met these criteria, and then in 2008–2010 biologists "ground truthed" these sites to determine if the mollusk assemblages were still viable. The last step was to find areas that were enrolled in conservation programs, which included IDNR and county forest preserve district properties. Once the data were compiled and analyzed, reintroduction sites were chosen.

Northern riffleshells marked with PIT tags

Jeremy Tiemann snorkling for mussles

Jeremy Tiemann holding a bag of mussles

During August 2010, 150 northern riffleshells were collected and then quarantined for a month at the Freshwater Mussel Conservation and Research Center at the Columbus Zoo and Aquarium in Ohio. The animals were then translocated to Illinois in September. Before being placed in the wild, staff from IDNR and the University of Illinois attached a PIT (passive integrated transponder) tag to each mussel shell to allow monitoring of the animals. In the following days, IDNR staff moved one-half of the animals to a gravel riffle in the Salt Fork and the other half to a gravel riffle in the Middle Fork of the Vermilion River. These animals were then monitored 3 times within the next 2 years using a PIT tag reader. During each of the 3 visits, a portion of the detected animals was examined to determine survivorship. At the end of the year, results were presented to the USFWS, who agreed to the translocation of more northern riffleshells plus clubshells. During August 2012, INHS, IDNR, and USFWS staff collected 1,000 northern riffleshells and 200 clubshells from the same site in Pennsylvania. After being quarantined and fixed with PIT tags, these animals were placed at 2 sites in the Salt Fork. Translocated mussels will continue to be regularly monitored over the next 5 years. This project is one of the first to determine if translocation is a viable option for bridge replacement projects.

INHS Collections Highlight: Annelids

The Phylum Annelida, or true-segmented worms, includes Acanthobdellida (bristle worms), Branchiobdellida (crayfish worms), Hirudinida (leeches), Oligochaetous Clitellata (microdrile oligochaetes and earthworms), and Polychaeta (sand worms, tube worms, or clam worms — primarily marine). With the exception of the acanthobdellidans (restricted to arctic marine systems), species in each of these groups occur in Illinois.

Earthworms (*Megadrile oligochaetes*) common in Illinois

The INHS Annelida Collection is the largest state collection of freshwater annelids in the country, holding more than 340,000 specimens. Over 70% of the freshwater oligochaetes in the collection are permanently mounted on microscope slides, while the remaining specimens are stored in alcohol in vials, jars, and tubes. The INHS Annelida Collection includes representatives of many species with limited known distributions in North America, although none is listed as endangered or threatened. The geographic scope of this collection is 76% from Illinois, 23% from elsewhere in the U. S. or Canada, and 1% from 20 other countries. Because oligochaetes are a common and often dominant group of organisms in aquatic macroinvertebrate samples, many of the specimens in this collection were identified from samples obtained during surveys for aquatic resources in streams and other habitats associated with IDOT project areas. Collections from IDOT project areas have provided new county and drainage basin records in the state for both aquatic and terrestrial worms, as well as new state records for 5 aquatic oligochaetes and 3 earthworms. Research projects by collections curator Mark Wetzel, often in collaboration with other INHS scientists, biologists at other institutions and agencies, and the interested public, have resulted in significant growth in numbers of specimens and diversity of this collection.

***Slavina appendiculata*, an aquatic microdrile oligochaete common in Illinois**

Illinois hosts 86 species of aquatic oligochaetes, 34 leeches, 9 branchiobdellidans, 3 aphanoneurans, and 38 earthworms. Several are considered rare in the state, including a few that are thus far known from only a few other localities in North America. Illinois is the type locality for 15 aquatic and terrestrial oligochaetes and leeches; type material for 7 of these species is held in the INHS Annelida Collection. A computer database for the collection was recently restructured to better organize and present metadata associated with specimens. Additional information on the INHS Annelida Collection and other INHS biological collections is available at http://wwx.inhs.illinois.edu/collections.

Herbarium Completes Online Database of Type Specimens

The INHS Herbarium has completed a project to capture images of its approximately 9,000 types (fungi, vascular plants, algae, and bryophytes). A type is a specimen that forms the basis of the original description of a species or other taxon. These digital images, available on JSTOR (plants.jstor.org), are not intended to replace the actual specimens but to augment the availability of these holdings. This project, funded by the Mellon Foundation, is part of a much larger initiative to create an online database that makes the information about individual types easily accessible to scientists throughout the world.

Mycological type specimen sheet

New and Updated Mudpuppy Records for Illinois

Andrew Kuhns holding a mudpuppy

INHS IDOT herpetologist Andrew Kuhns reported 1 new record and confirmed 2 known locations of the mudpuppy, *Necturus maculosus*, in or near the corridors of 3 IDOT projects (Illiana Express, Tier 4 High Speed Rail Corridor, and US Route 51 Addendum D) examined in 2012.

The mudpuppy is a large (up to 19" in length, but averages 12"), fully aquatic salamander distinguished from other salamanders in Illinois by having 4 toes on the hind feet and large bushy gills. A dark line that bisects the eye terminates at the external gills and the species often has dark blotches on its sides and tail. Their range extends from southern Quebec to northern Alabama, Mississippi, and Georgia. They inhabit a multitude of habitats including muddy canals, large fast-flowing rivers, and large cool-water lakes. In Illinois, they primarily inhabit lakes, ponds, rivers, and large creeks with clear water, but can survive in alternative habitat if rocky areas are available for reproduction. The species is most active in October and November when breeding occurs, although a 2nd breeding bout may occur in late winter and early spring. Females deposit eggs in nests under rocks, logs, and other cover objects in May and June. Eggs hatch in 1 to 2 months and the larvae do not reach reproductive age for 5 years. Mudpuppies are predatory and prey consists mostly of invertebrates (annelids, insects, mollusks, and crayfish) but may also include amphibians and fish. Mudpuppies are primarily nocturnal. During the day they shelter under rocks, logs, bank undercuts, and other cover objects. They primarily forage for food at night but may forage during the day in weedy and muddy habitats. Mudpuppies appear to be most active at cooler water temperatures with most captures occurring at water temperatures around 40° F.

In 2010, the mudpuppy was added to the list of Illinois Threatened and Endangered Species due to a decrease in recent observations of the species in the state. The mudpuppy also is the only known glochidial host of the salamander mussel, *Simpsonaias ambigua* (Mollusca, Unionidae). Glochidia are the microscopic larval stage of freshwater mussels that parasitize to the gills of fish or, in the case of *S. ambigua*, mudpuppies for a time prior to dropping to the substrate where they begin taking the form of a typical mussel. The salamander mussel is a State Endangered species in Illinois and a candidate for federal listing by the United States Fish and Wildlife Service. Thus, conserving *N. maculosus* also may aid in the conservation of *S. ambigua*.

Mudpuppy *(Necturus maculosus)*

2012 Updates to the Illinois Natural Heritage Database

The Illinois Natural Heritage Database houses information on 484 state and federally endangered and threatened species, 92 high-quality natural community types, and special features such as heron rookeries and large forest blocks. In 2012, INHS staff working on IDOT projects for the Wetland Science Program and Biological Surveys Program reported 618 sightings of threatened or endangered species, including 520 invertebrates, 25 reptiles and amphibians, 38 plants, 18 fish, 3 mammals, and 14 birds. Of the 618 threatened and endangered species reported, 32 were records of new species or new locations.

Crayfish of

Of the approximately 600 known species of crayfish, 375 occur in the United States. Illinois is home to 23 species, 4 of which are listed as State Endangered. Crayfish occur in almost all types of aquatic habitats, from sluggish and standing water bodies such as swamps, ditches, and sloughs, to flowing bodies of water such as creeks and rivers. They also occur in varying types of substrate, some prefer muddy, silty bottoms whereas others prefer rocky and sandy streambeds. Other species spend life primarily in constructed burrows, and only come up to mate or when very wet events occur such as flooding.

Mating events typically occur in the fall and spring seasons. Males have a long process used for mating that changes shape between periods of sexual activity. Males with a process ready for sexual activity are referred to as Form I, whereas males with a process unsuited for sexual activity are Form II. Females typically store sperm until spring when they lay their eggs. Eggs are deposited and cemented to the underside of the females abdomen with a substance secreted from special glands. The eggs are carried by the female for 2–20 weeks until hatching. Upon hatching, the juveniles remain attached to the mother's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1) The shrimp crayfish (*Orconectes lancifer*) occurs in low, swampy habitat in extreme southern Illinois. The species gets it common name from the fact that it resembles a shrimp almost as much as it does a crayfish. It's small, narrow claws and thick abdomen are unique among North American crayfishes. Like the bigclaw crayfish, the shrimp crayfish is protected as State Endangered in Illinois since it has a very restricted range — it is only known to occur in Horseshoe Lake in Alexander County.

2) The devil crayfish (*Cambarus diogenes*) is a species that is found along stream and lake margins across Illinois. The species is one of several in Illinois that digs a complex system of burrows and tunnels near these water bodies. The devil crayfish will spend a significant portion of its life below ground and will only occasionally be found in permanent water bodies when it is foraging for food or during reproductive activities.

3) The bigclaw crayfish (*Orconectes placidus*) is a stream-dwelling species that is found under gravel and rocks in clear streams. In Illinois, it only occurs in the Big Creek drainage in the extreme southeastern portion of the state. Since it has a very limited range in the state, it is listed as State Endangered.

Illinois

abdomen through 3 molts of their exoskeleton before they are fully developed and large enough to forage independently. The juveniles grow throughout the summer and attain sexual maturity by late summer or early fall.

Crayfish are generally considered to be omnivorous and they play an important role in aquatic ecosystems. Their diet consists of aquatic and terrestrial plant matter, decaying plant matter, insects, snails, small fish, and carrion. Crayfish turn this energy into animal protein which is then made available to higher trophic level fish, mammals, and birds that prey on crayfish.

Dr. Chris Taylor and his graduate students have an active research program examining the ecology, systematics, and conservation of Illinois and midwestern crayfishes. Dr. Taylor also is currently working on a field guide to midwestern crayfish.


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4) As its name implies, the digger crayfish (*Fallicambarus fodiens*) is primarily a burrowing species that spends most of its life below ground. It is found across eastern and southern Illinois, but given its burrowing behavior, it is only occasionally encountered. The species digs a complex system of tunnels and chambers in low lying floodplain regions that are ephemerally flooded.

5) The northern clearwater crayfish (*Orconectes propinquus*) is a common Illinois species found in streams in the central and northern part of the state. This nonburrowing species is usually found under rocks in areas of streams with higher flow rates.

6) The White River crayfish (*Procambarus acutus*) occurs in low gradient streams and floodplain habitats across Illinois. While generally found in permanent water bodies, the species is able to dig deep burrows in floodplain habitats during periods of drought.

Botanical Surveys

Biological Surveys Program botanists conducted surveys at 16 IDOT project areas throughout Illinois in addition to those featured in this report (Decurrent False Aster Survey, U.S. Hwy 50, Illiana, High-speed Rail Prairie Survey). Five surveys were focused on the Federally Threatened eastern prairie fringed orchid (*Plantanthera leucophaea*). Although no populations of this prairie orchid were found, several prairie remnants were discovered, including a small prairie assemblage near Lake Michigan in Lake County dominated by sand dropseed (*Sporobolus cryptandrus*) and containing many indicator species of high-quality prairie (e.g., Sullivan's milkweed [*Asclepias sullivantii*], purple prairie clover [*Dalea purpurea*], prairie brome [*Bromus kalmii*], prairie Indian plantain [*Arnoglossum plantagineum*], prairie phlox [*Phlox pilosa*], wild quinine [*Parthenium integrifolium*], and Culver's root [*Veronicastrum virginicum*]). In total, nearly 100 species were found in this 0.2-acre prairie.

Prairie along an abandoned railroad near Shobonier, IL

INHS IDOT botanists also surveyed 50 miles of the Iowa Interstate Railroad (IAIS RR) right-of-way between Wyanet and Rock Island, as part of the Chicago to Quad Cities Passenger Rail Service Project, in search of natural areas and populations of threatened and endangered species. A previously known population of the State Threatened ear-leaved foxglove (*Tomanthera auriculata*) was confirmed extant and 19 remnant prairie communities totaling >30 acres were located and inventoried. Several of these prairies contained species associated with undisturbed prairie, including prairie dropseed (*Sporobolus heterolepis*), downy gentian (*Gentiana puberulenta*), and green milkweed (*Asclepias viridiflora*). Two sites already listed in the Illinois Natural Area Inventory (INAI) were revisited, and a previously undiscovered dry gravel prairie, now under consideration for future inclusion in the INAI, was described.

Downy gentian (*Gentiana puberulenta*)

Green milkweed (*Asclepias viridiflora*)

The Wyanet Connection Project, near the east end of the Wyanet to Rock Island Project, involves the proposed construction of a railroad track connection between the IAIS RR and the Burlington Northern Santa Fe Railroad. This was the 3rd year of surveys associated with this project, in part because previous surveys revealed many high-quality prairie remnants along this stretch of railroad. No new high-quality remnant prairie habitats were found within the survey limits in 2012, but a high-quality gravel prairie was discovered immediately adjacent to the survey boundaries. Gravel prairie is one of the rarest prairie types in Illinois, and this 2.5-acre remnant is one of the largest known in the state and has been nominated as an INAI site.

High-quality prairie remnant in Lake County

Botanical surveys conducted in the U.S. Route 51 study area, a proposed lane expansion and upgrade from south of Pana to Centralia, marked the 5th year of surveys on this project. The 2012 addendum included an additional 1,219 acres in which numerous forest habitats were evaluated, as well as one roadside prairie adjacent to an abandoned railroad, near Shobonier. Finally, the IL 83 and IL 137 Project Area in Lake County borders Deep Lake, a natural lake formed in a glacial pothole. Botanists working on this project documented the continued occurrence of the State Threatened variable-leaved pondweed (*Potamogeton gramineus*) in Deep Lake. This species requires clear water to survive.

Preparing for High-Speed Rail in Illinois

Plans are under consideration to bring high-speed rail to Illinois. INHS IDOT botanist Bill Handel began botanical surveys in 2012 on the High-Speed Rail Project from Chicago to St. Louis. From February 1 to October 31, approximately 174 miles of Union Pacific Railroad (UPRR) right-of-way from Godfrey to Dwight were surveyed. In addition to conducting searches for endangered and threatened species and high-quality natural areas, IDOT also emphasized that any areas with prairie vegetation should be mapped and assigned natural quality grades. During the survey, 72 remnant areas of natural vegetation totaling 258 acres were identified. Approximately 36 acres of these remnant areas were considered good to high quality. The majority of the areas were prairie remnants, but several woodland and savanna communities were also identified. Seven areas listed as INAI sites or Illinois Nature Preserves were revisited and 2 populations of endangered and threatened plant species were relocated. Some of the interesting native species found during the survey that are indicators of good habitat quality include downy gentian (*Gentiana puberulenta*), large ground plum (*Astragalus crassicarpus* var. *trichocalyx*), prairie Indian plantain (*Cacalia plantaginea*), smooth phlox (*Phlox glaberrima*), and Virginia bunchflower (*Melanthium virginicum*).

Smooth phlox (*Phlox glaberrima*)

Virginia bunchflower (*Melanthium virginicum*)

Illiana Expressway: Finding and Assessing Remnant Vegetation Communities

The Illiana Expressway is an approximately 50-mile toll road proposed for northeast Illinois and northwest Indiana, which would connect Interstate 55 north of Wilmington, IL, and Interstate 65 near Lowell, IN. During the 2012 growing season, botanical surveys were conducted in a region of Will County, where several alternative routes to connect these 2 interstates have been proposed.

The 2012 Illiana study corridor encompassed approximately 14,000 acres, including vegetative communities such as prairie, sand prairie, sand savanna, upland forest, sedge meadow, marsh, seep, floodplain forest, and various aquatic habitats along the Kankakee River. Several high-quality remnant communities were discovered, new locations were found for 2 State Threatened species (forked aster, *Aster furcatus*, and ear-leaved foxglove, *Tomanthera auriculata*), and many new regional or county botanical records were discovered for this portion of Illinois. Botanical surveys for the Illiana Project will be concluded in early 2013.

1) Cardinal flower (*Lobelia cardinalis*)

2) Rattlesnake master (*Eryngium yuccifolium*)

3) Prickly pear cactus (*Opuntia humifusa*)

4) Swamp milkweed (*Asclepias incarnata*)

5) Sand phlox (*Phlox bifida*)

6) Bottle gentian (*Gentiana andrewsii*)

Snapshots From The Field


Six-lined racerunner (*Cnemidophorus sexlineatus*)


Leadplant (*Amorpha canescens*)


Smooth earth snake (*Virginia valeriae*)


Ornate box turtle (*Terrapene ornata*)


Slender bulrush (*Schoenoplectus heterochaetus*)


Red bat (*Lasiurus borealis*)


Painted turtle (*Chrysemys picta*)


Great Egret (*Ardea alba*)


Tiger beetle (*Cincindella sexguttata*)


Bumblebee (*Bombus fervidus*)


Gray treefrog (*Hyla chrysoscelis*)

2012 Milestones and Changes

•In 2012, 13 INHS IDOT scientists published 26 papers in peer-reviewed journals, and 16 scientists presented, co-authored, or led 58 oral presentations, posters, or workshops at scientific conferences.

•Paul Marcum, Dave Ketzner, John Taft, Kevin Cummings, Jeremy Tiemann, Steve Taylor, Joe Merritt, and Ed Heske served as Technical Expert Consultants reviewing the status of Illinois flora and fauna for the Illinois Endangered Species Protection Board. INHS IDOT botanist John Taft is a member of the board.

•Joe Merritt continued to serve as Editor of the *Journal of Mammalogy*. *JM* is the primary publication of the American Society of Mammalogists, the premier scientific organization dedicated to the study of mammals, and was voted one of the 100 most influential serials in biology and medicine over the past 100 years by the Special Libraries Association.

•Ed Heske became President of the American Society of Mammalogists, and will serve a 2-year term starting July 2012.

•Mark Wetzel was reappointed as Associate Editor of *Megadrilogica*, the journal of oligochaete biology, for 2012 and 2013.

•Mark Wetzel was reaffirmed as General Secretary for the International Symposium on Aquatic Oligochaeta, which convened for their 12th triennial meeting in Western Australia in 2012.

•Jesse Kurylo continued to chair the Public Relations and Education Committee for the Illinois Soil Classifiers Association and was elected Chair of the Botanical Section of the Illinois State Academy of Sciences.

•Jeremy Tiemann won the Best Poster Award at the 2012 meeting of the Illinois Chapter of the American Fisheries Society.

•Jeannie Barnes taught the Ornithology section of the Master Naturalists class in Sangamon County.

•Scott Wiesbrook taught the Soils section of the Master Naturalists class for East Central Illinois.

•Mike Murphy taught a 2-day work shop in southern Illinois on identification of sedges (genus *Carex*).

•John Taft and Ed Heske were elected to the List of Teachers Ranked as Excellent by Their Students for courses taught at the University of Illinois in 2012.

•Jeff Matthews was hired as Assistant Professor in the Department of Natural Resources and Environmental Sciences, University of Illinois Urbana-Champaign.

•George Geatz received his MS degree from the University of Maryland, and will begin a PhD program at the University of Illinois in 2013.

•Bill Handel served on the advisory committee for the ongoing study, Native Vegetation Establishment for IDOT Erosion Control Best Management Practices, conducted by Ryan Busby, U.S. Army Engineer Research and Development Center for the Illinois Department of Transportation.

•Kevin Johnson left the INHS IDOT Biological Surveys Program in 2012 to become a full-time Research Program Leader at INHS.

•Mary Ann Feist left the Wetland Science Program to begin a postdoc at the New York Botanical Garden.

•Jason Zylka left the Wetland Science Program to become a Restoration Ecologist with the Will County Forest Preserve.

•New additions to the INHS IDOT team included botanists Christine Bertz, Meg Engelhardt, Julie Nieset, Susan McIntyre, Ben Beas, and soil scientist Jenwei Tsai.

2012 Calendar Year — Technical Reports Submitted by the Wetlands Program

Beas, B., G. Geatz, J. Tsai, D. Ketzner, and D. Skultety. 2012. Wetland delineation report: US 30 (FAP 349) at 119th Street, Will County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (98): 1–25.

Beas, B., G. Geatz, B. Zercher, J. Nieset, and P. Marcum. 2012. Wetland delineation report: East Side Highway, Addenda A and B, McLean County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (97): 1–114.

Beas, B., J. Kurylo, D. Ketzner, and D. Skultety. 2012. Wetland delineation report: US 67 (FAP 310) at Pope Creek, Mercer County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (55): 1–26.

Beas, B., J. Kurylo, D. Ketzner, B. Zercher, and J. Adomaitis. 2012. Wetland delineation report: IL 8 (FAS 380) at Hickory Creek, Knox County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (57): 1–21.

Beas, B., J. Tsai, D. Skultety, B. Zercher, and S. McIntyre. 2012. Wetland delineation report: US 14 (FAP 0305), Lake County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (88): 1–133.

Draheim, I., D. Ketzner, and D. Skultety. 2012. Wetland delineation report: US 20 (FAP 021) East of Roselle/Bloomingdale Road, DuPage County, Illinois, DuPage County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (18): 1–16.

Draheim, I., B. Wilm, P. Marcum, M. Engelhardt,and B. Zercher. 2012. Wetland delineation report: IL 92 (FAP 599), from 115th St. in Andalusia to Hauberg Trail, Rock Island County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (60): 1–80.

Draheim, I., B. Wilm, S. Wiesbrook, and B. Zercher. 2012. Wetland mitigation monitoring report: FAU 5822 (Milan Beltway, Rock Island Site), Rock Island County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (4): 1–45.

Draheim, I., B. Wilm, and B. Zercher. 2012. Wetland delineation report: IL 92 (FAP 599) over Big Branch Creek, Rock Island County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (38): 1–16.

Engelhardt, M., G. Geatz, B. Wilm, P. Marcum, and B. Zercher. 2012. Wetland delineation report: 5th St. in Herrin to Christmas Tree Rd. (FAS 903/FAU 9588), Williamson County, Illinois. INHS/IDOT Wetlands Vegetative and Soils Program Report 2012 (71): 1–62.

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A Hummingbird Clearwing *(Hemaris thysbe)* observed during an IDOT field survey in Lake County, Illinois. Photo By Paul Marcum

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